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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,856	06/07/2005	Roland Anthony Tacke	1304.066USU	1935
27623 7590 06/03/2009 OHLANDT, GREELEY, RUGGIERO & PERLE, LLP ONE LANDMARK SQUARE, 10TH FLOOR STAMFORD, CT 06901				
EXAMINER VERDERAME, ANNA L.				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/532,856

**Applicant(s)**

TACKEN ET AL.

**Examiner**

ANNA L. VERDERAME

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5,7-9 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-9 and 12-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The response filed on 02/11/2009 has been carefully considered. A response is presented below.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 5 recite "diffusion of molecules of the adhesive into the photoresist layer" and that this diffusion results in a solubility gradient being exhibited along the normal of the adhesive. There is no support for this in the applicant's specification. Section (0015) is the only section that discusses diffusion of adhesive molecules. However, it is disclosed that the adhesive molecules diffuse into a subphotoresist layer due to their proximity to each other. The solubility gradient is still due to the fact that subphotoresist layer nearest the adhesive layer has been exposed/partially cured and the second subphotoresist layer, formed on top of the other photoresist layer, has not. Adhesive molecules will obviously diffuse into a layer provided in contact with it. However, this does not cause the photoresist layer to exhibit a solubility gradient. Partial cross-linking of the lower subphotoresist layer is what causes this.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 12 recites the limitation "the subphotoresist layers" in line 2. There is insufficient antecedent basis for this limitation in claim 12 or claim 5. Further claim 5 recites a single photoresist layer.

*This rejection is being maintained. Claim 5 still recites a single photoresist layer and does not recite subphotoresist layers.*

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1,3-5, and 12-14 are rejected under 35 U.S.C. 102(a) as being anticipated by Hendriks et al. WO 02/09103.

Hendriks et al. teaches a method for manufacturing a substrate for use in a stamper manufacturing process comprising the following steps; a) coating a cross-linkable chemical composition on a substrate; b) subjecting the undercoating applied in step a to a cross-linking reaction; and c) applying a top coating of photosensitive material to the undercoating that has been cross-linked in step b, wherein the thickness of the cross-linked undercoating of step b) is selected so that the maximum

energy intensity during the exposure step of the stamper manufacturing process occurs at the desired post height of the top coating that is to be developed (page 4 lines 10-19). In particular step b) is carried out by using a heat treatment, in particular at a temperature ranging from 150-250°C. Such a temperature range will result in three-dimensional cross-linking of the polymer chains of the chemical composition provided in step a). In another embodiment step b) is carried out using an exposure step, in particular in the wavelength range of 200-300 nm (UV-light). The exposure time is in particular 5-180 seconds, whereby the exposure step is carried out in particular while rotating and/or heating the substrate. Since the cross-linkable composition has undergone a cross-linking reaction in step b), the thus cross-linked composition is not soluble, or only to a small degree, in the solvent that is used in the photosensitive material that has been provided in step c). In step d) solvent is removed from the top coat by heating the layer at a temperature of maximally 130°C so as to assure that no further cross-linking of the lower layer occurs (5/9-30). Further, the reference discloses that it is desirable to subject the substrate to a preparation step prior to carrying out step a), which comprises the cleaning of the substrate and possibly the application of an adhesion layer for the cross-linkable composition that is applied in step a). The adhesion layer, on account of its thickness can only be considered a **“monolayer”** (page 2 line 20). The present substrate is in particular suitable for use in a method for manufacturing a stamper, which stamper is placed in the mould of an injection molding machine for mass producing CD replicas (page 6/line 30-page 7/line 1). The limitation of claims 12-13 are disclosed at (page 2 lines 8-15).

**The method of Hendriks et al. produces a photoresist having a desired height and shape(3/20-21).**

The applicant argues that Hendricks et al. relates to a method for fabricating a stamper plate while the instant claims related to a method of forming a master plate for fabricating a stamper plate. This is incorrect. As recited in the title Hendricks et al. relates to a method of manufacturing a substrate for use in a stamper manufacturing process. The present substrate is in particular suitable for use in a method for manufacturing a stamper, which stamper is placed in the mould of an injection molding machine for mass producing CD replicas(page 6/line 30-page 7/line 1). Hendricks's substrate corresponds to the applicants' master plate.

The applicant argues that Hendricks does not teach a gradient in the solubility along the normal of the photoresist layer. This is incorrect. The cross-linkable layer is photosensitive as evidenced by the disclosure that in one embodiment the layer is cross-linked using UV-light. It is disclosed that the cross-linkable layer is not soluble, or only to a small degree, in the solvent that is used in the photosensitive material that has been provided in step c).

Applicant states that the under-coat is fully cross-linked and only the top photoresist is sensitive to light for the recording process. This is correct, however this does not change the fact that the material used for the under-coat is photosensitive. Further, the examiner points to section (0034) of the applicant's specification which recites " in a first step the first sub-photoresist layer 8.1 is cured using a curing treatment. As a result of the curing treatment, the solubility of parts after exposure is reduced definitively. The curing treatment can consist in the complete exposure of the sub-photoresist layer to a

UV light beam.” See also disclosure at (0032) of the specification which recites “ as a result of the cross-linking reaction a first sub-photoresist layer 8.1 has formed, exposed parts of which have a first solubility in the alkaline solvent. Above the sub-photoresist layer a second sub-photoresist layer 8.2 has formed.” Therefore the claims clearly embrace a stepwise gradient in solubility.

*The applicant has amended claim 1 to recite a master plate comprising a single photoresist layer. The photoresist layer exhibits a solubility gradient along the normal. Since claims 1 and 3 are drawn to an article and not a method of making, the master taught by Hendriks wherein the photoresist is formed in two steps, meets the limitations of claim 1. The solubility of the cross-linked layer will be different that that of the un-cross-linked layer and therefore the embodiment taught by Hendriks will exhibit a solubility gradient along the normal. The applicant has the burden of showing the a single photoresist layer exhibiting a solubility gradient along the normal is different from the photoresist layer of Hendriks.*

*Amendment of the claims to recite a single photoresist layer made by providing a first material and a second material on the substrate such that the solubility exhibits a gradient along the normal to the photoresist layer is supported by the claims. See for example (page 5, lines 15-21). However, the applicant has misinterpreted the teachings found on page 9, line 22 to page 10, line 5. The applicant asserts that this section teaches a substrate having a cross-linked photoresist layer provided with a new first sub photoresist layer and a second subphotoresist layer. In fact the section teaches a cross-linked first subphotoresist layer which is provided with a second subphotoresist layer. In lines 9/15-25 the formation of the first cross-linked*

*subphotoresist layer is described. The result of the method described in lines 9/15-25 is illustrated in figure 4. This is supported by the recitation in lines 9/25-26 that after the cross-linking reaction a "situation schematically represented by figure 4 arises". Figure 4 shows a substrate, an adhesive layer and a cross-linked layer having a first solubility. Formation of a second photoresist layer on the first photoresist layer is taught at 10/1-5. The applicant has misinterpreted the term "new" to mean a new layer formed on the cross-linked layer formed in lines 9/15-25. However, if this were true figure 4 would show 4 layers formed on the substrate 4 instead of 3. The embodiment taught in the Hendriks et al. WO 02/09103 reference corresponds to that of figure 3b of the instant specification where the crosslinked layer is a sublayer of photoresist material.*

### ***Claim Rejections - 35 USC § 103***

7. **The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-5, and 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Hendriks et al. WO 02/09103 in view of Kondo et al. JP-10-031848.

Hendriks et al. discloses a mastering process which discloses all the limitations of the instant claim including the provision of a monolayer adhesion layer between the



substrate and the first sub-photoresist layer. Kondo is combined with Hendriks because Kondo discloses a mastering process where the adhesive is the same as that used by applicant.

Hendriks discloses that it is desirable to subject the substrate to a preparation step prior to carrying out step a), which comprises the cleaning of the substrate and possibly the application of an adhesion layer for the cross-linkable composition that is applied in step a). The adhesion layer, on account of its thickness can only be considered a “**monolayer**”(page 2 line 20).

Kondo et al. discloses a method for forming an optical disc master which involves polishing a glass disc, washing and drying the glass disc, applying an adhesive layer, and the applying a photoresist layer. In an example a washed and dried substrate is rested for three minutes in a saturated vapor of HMDS. Rinsing is not performed after the adhesive has been applied.

It would have been obvious to one of ordinary skill in the art to modify the method taught by Hendriks et al. by preparing the substrate by polishing a glass disc, washing and drying the glass disc, and applying an HMDS adhesive layer by resting the washed and dried substrate in a saturated vapor of HMDS for three minutes.

The examiner notes that the adhesive used by Kondo et al. is identical to that used by applicant. Also, A rinsing step after application of the adhesive layer is not disclosed. The applicant states that by not rinsing after the adhesive layer application step, a relatively thick adhesive layer is formed.

9. Claim 1,3,4 & 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hendriks et al. WO 02/09103 in view of Peterson et al. 5,702,767.

Hendriks et al. WO 02/09103 teaches the application of an adhesion layer, but does not teach the limitations recited in claim 7.

Peterson teaches a method for providing an inorganic substrate having improved adherence for polymeric films(abstract). In examples 1-3 Peterson applies HMDS to a silicon wafer(11/35-55). Practical application of the invention is disclosed at (11/15-33). Suitable substrates are taught at (8/19-33). Disclosure of TMSDEA and HMDS as priming agents is found at (2/59-63).

It would have been obvious to one of ordinary skill in the art to modify the method for manufacturing a substrate for use in a stamper manufacturing process taught by Hendriks et al. by forming an adhesion layer on the substrate prior to step a.) wherein the adhesion layer is HMDS **monolayer** based on the disclosure to form an adhesion layer in Hendriks et al. and based on the example of Peterson et al. found at (11/25-55) and with the reasonable expectation of forming a substrate having an improved adherence for polymeric films as disclosed in the abstract of Peterson et al.

This embodiment renders obvious embodiments having primer, crosslinked/cured photoresist and actinic photoresist layers.

10. Claims 1,3,4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hendriks et al. WO 02/09103 in view of Peterson et al. 5,702,767 as presented above, and further in view of Thompson 6,361,921.

Hendriks et al. WO 02/09103 in view of Peterson et al. 5,702,767 as presented above does not teach rinsing the adhesive layer directly upon application for a relatively short amount of time. The references also do not teach a rinsing time of 5 seconds at maximum as recited in claim 9.

Thompson teaches a comparative example in which HMDS is coated on glass slides(10/50-60). The method usually comprises formation of a primer on a cleaned substrate of silicon, nickel, etc. Thompson teaches washing the surface with an effective amount of the priming composition. Further, Thompson teaches optionally rinsing the surface of the substrate with an aqueous solution(water) sufficient to remove contaminants and leave a **thin film** of priming composition on the cleaned surface. A photoresist is then formed on the priming composition layer(3/12-30).

Formation of an adhesive monolayer is clearly articulated by Hendriks et al. Further, rinsing to remove contaminants immediately after application of the adhesive layer is articulated by Thompson. The rinsing time needed to achieve the adhesive monolayer depends upon the thickness of the originally applied adhesive layer. If a thick adhesive layer is applied a longer rinsing time can be employed. If a thinner layer is applied a shorter rinsing time is necessary. Also, there is a minimum amount of rinsing time necessary to achieve any sort of result including removal of contaminants. Therefore, it would have been obvious to one of ordinary skill in the art to optimize the rinsing time in order to achieve the desired adhesive monolayer.

The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in absence of unexpected results. In re Aller, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the rinsing time in order to achieve the desired adhesive monolayer. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective(longer rinsing

times lead to the removal of more material), are unexpectedly good In re Boesch and Slaney, 205 USPQ 215.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process taught by the combination of Hendriks et al. WO 02/09103 in view of Peterson et al. 5,702,767, by rinsing the HMDS layer immediately after application in order to remove contaminants based on the teachings of Thompson, and with the reasonable expectation of forming an adhesive monolayer which is free of contaminants.

### ***Response to Arguments***

Applicant has amended claim1 to recite the provision of an adhesive layer. Hendriks et al. discloses an adhesive layer.

The applicant notes that claims 12-14 have not been rejected on prior art and are thereby drawn to allowable subject matter. This is incorrect. Claims 12-14 have been rejected under 35 U.S.C 102(a) as being anticipated by WO 02/09103(Hendriks et al.). Applicant even acknowledges that these claims have been rejected in paragraph 6 on page 5 of the response filed on 2/11/09.

With respect to the rejections over Hendriks et al., the applicant argues that because Hendriks et al is concerned with making a stamper and the present claimed invention is concerned with making a master plate that the claimed is novel. This reasoning is flawed. Both Hendriks et al. and the instant application relate to a

mastering process. In a mastering process a patterned master disc is created. The master disc is usually created by a lithographic process. Then the master disc is used either to form a stamper or the master disc itself is used as a stamper. Hendriks et al. discloses that "the present substrate is in particular suitable for use in a method for manufacturing a stamper, which stamper is placed in the mould of an injection molding machine for mass producing CD replicas". The substrate in this case is a master disc. Further, in paragraph 2 on page 2 of the applicant's a method of making a stamper from the master disc is disclosed.

On page 6 of the response the applicant argues that the two layers in Hendriks et al. are obtained by [forming] the photoresist layers in two steps and that this is in direct contrast to the instant invention. This is incorrect. The examiner has pointed out that the applicant's disclosure teaches a photoresist layer that is formed in two steps. This argument was presented in the office action of 10/31/2008 and is printed below.

*The examiner points to section (0034) of the applicant's specification which recites "in a first step the first sub-photoresist layer 8.1 is cured using a curing treatment. As a result of the curing treatment, the solubility of parts after exposure is reduced definitively. The curing treatment can consist in the complete exposure of the sub-photoresist layer to a UV light beam." See also disclosure at (0032) of the specification which recites "as a result of the cross-linking reaction a first sub-photoresist layer 8.1 has formed, exposed parts of which have a first solubility in the alkaline solvent. Above the sub-photoresist layer a second sub-photoresist layer 8.2 has formed."*

This clearly illustrates that the applicant intends that the single photoresist layer is formed in two steps by applying two sub-photoresist layers. The applicant has recited sub-photoresist layers in claim 12 and in claim 5 recites that the layer is formed by

providing a first material and a second material. The solubility gradient is formed by partially curing one of the subphotoresist layers.

### ***Conclusion***

**11. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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